

EXHIBIT 3

For Federal criminal/civil case filing
-- PETITIONER'S BRIEF / MEMORANDUM IN
OPPOSITION TO "MOTION TO DISMISS
MOTION TO VACATE, SET ASIDE, OR
CORRECT SENTENCE" (Document #141) --
OPPOSING BRIEF IN OPPOSITION TO THE
GOVERNMENT'S/MOVANT'S MOTION UNDER
DOCUMENT #141 --

Brian David Hill (Petitioner) v. United States of
America (Respondent)

Criminal Case Number 1:13-cr-435-1
Civil Case Number 1:17-CV-1036



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ANALYSIS OF FUNCTIONS OF DELAYED ECHOLALIA IN AUTISTIC CHILDREN

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This study was a preliminary attempt to determine how autistic children used delayed echolalia in naturalistic interactions with familiar people. Fourteen functional categories of delayed echolalia were derived based on videotape analyses of linguistic, extralinguistic, and paralinguistic features. Individual differences in functional usage were apparent across the three subjects. Delayed echolalia was found to vary along the dimensions of interactiveness, comprehension of the utterance produced, and relevance to linguistic or situational context. The diversity of delayed echolalic behavior is discussed in reference to its conventionality, the presence or absence of communicative intent, and its status as symbolic communicative activity.

Language delay and deviant language characteristics are criterial features of the autistic syndrome (Rutter, 1978). One frequently cited form of so-called deviant language is echolalia, which, in general, refers to the repetition of utterances produced by others. What makes echolalic behavior in autism truly distinct from repetition in the language of normal children is the fact that it often remains a significant part of the verbal behavior of autistic children for extended periods of time (Fay, 1969). In addition, echoic utterances often are rigidly reproduced with no clear evidence of communicative intent.

Two general categories of echolalia have been identified in the language of autistic individuals. *Immediate echolalia* refers to repetitions that are produced either following immediately or a brief time after the production of a model utterance. *Delayed echolalia* refers to utterances repeated at a significantly later time. Problems concerning definitional criteria for echolalic behaviors are abundant. Such problems are most apparent when considering the dimensions of exactness of repetition, degree of comprehension of the utterance repeated, and the presence or absence of communicative intent underlying the production of echoic utterances. The lack of operationally defined criteria for echolalic behavior cannot be attributed solely to oversights of theorists and researchers. Echolalic behaviors, both immediate and delayed, are best described as a continuum of behaviors in regard to exactness of repetition, degree of comprehension, and underlying communicative intent (Prizant, 1983a; Schuler, 1979). The decision as to whether an utterance may or may not be called echolalic depends on one's theoretical orientation and involves a judgment which has to be based on criteria that are somewhat arbitrary in nature. [See Fay and Schuler (1980) and Schuler (1979) for in depth discussions of definitional problems.]

Immediate echolalia has received the greatest amount of attention from researchers, probably because it is easily identified. Research on immediate echolalia has

focused on structural linguistic considerations as well as functional issues. Some researchers have considered it to be a meaningless parroting that serves no apparent purpose (Lovaas, 1977; Schreibman & Carr, 1978), whereas others have discussed immediate echolalia as a primitive attempt to maintain social contact when an individual is confronted with language beyond his/her linguistic competence (Fay, 1973; Shapiro, 1977). Prizant and Duchan (1981) conducted the first systematic study which attempted to discover specific functions of immediate echolalia by analyzing the utterances of four highly echolalic autistic children. Seven functional categories of immediate echolalia were derived based on videotape analyses of 1,009 utterances produced by the children in interactions with familiar adults in school and at home during an 8-month period. Segmental, suprasegmental, nonverbal, and situational features were taken into account in deriving the categories. The children in the study produced echoic utterances which were interactive as well as non-interactive and which were produced with and without evidence of comprehension. The specific functional categories derived included *nonfocused, turn-taking, declarative, yes-answer, request, rehearsal, and self-regulatory*.

Delayed echolalia, which has been defined as "echoing of a phrase after some delay or lapse of time" (Simon, 1975, p. 1440) or as unrestructured old forms used in new situations (Shapiro, 1977), has received considerably less attention from researchers. Sources of information about delayed echolalia in autism have been limited to a few studies and reports. Lovaas, Varni, Koegel, and Lorsch (1977) collected utterances from three autistic children who had frequently produced "self-stimulatory" delayed echolalia. The researchers, arguing within an operant framework, claimed that their subjects' delayed echolalia was under control of intrinsic rather than extrinsic reinforcement. They used their findings to explain why certain types of "psychotic speech" could not be extinguished, but they did not consider what functions the utterances may have served. Baltaxe and Simmons (1977,

1981) attempted to understand the significance of delayed echolalia from the perspective of language acquisition. They collected audio recordings of the bedtime soliloquies of an 8-year-old autistic girl. All utterances were produced by the child in the absence of other people in the environment; therefore, they could not be considered communicative. The apparent linguistic sophistication of many of the utterances indicated to the researchers that they were forms of delayed echolalia. Baltaxe and Simmons believed that the patterns of utterance production were a type of linguistic practice in which the child substituted, deleted, and/or conjoined segments of utterances which resulted in delayed mitigated echolalia, that is, delayed echolalia with structural changes imposed by the child. The authors indicated that such pattern practice may have been a strategy by which their subject segmented memorized forms which, they speculated, may be a first step towards the acquisition of a rule-governed, generative linguistic system for echolalic children. In a follow-up account of higher functioning autistic individuals, Kanner (1973) hypothesized that delayed echolalia represented an intermediate stage in movement from immediate echolalia to more flexible and creative language.

Some researchers have acknowledged that delayed echolalia may serve some purpose in communication; however, most of these accounts have been anecdotal or very general in nature. Dyer and Hadden (1981) discussed six "functional categories" of delayed echolalia that they noted in informal observations of autistic children. They indicated that some forms of delayed echolalia were produced with no apparent communicative intent. Rather than citing specific types of functions, Dyer and Hadden labeled their categories with terms that suggest structural rather than functional criteria (e.g., stereotypic, negativistic, egocentric, time-lag, transferred, and mitigated). Their discussion of these categories does represent an attempt to delineate the possible range of usage of delayed echolalia; however, the categories were not derived from systematic analyses.

Wolff and Chess (1965) proposed two categories of delayed echolalia: *noncommunicative repetition*, which serves no apparent purpose, and *communicative repetition*, which is used for communication even though it consists of the exact phrases a child has heard others use. Ricks and Wing (1975) discussed the appropriate use of phrases which were copied from others, such as "Do you want a biscuit?" used as a request, and Baltaxe and Simmons (1975) made a brief reference to communicative delayed echolalia as serving a labeling function. Schuler (1976) also viewed echolalia on a continuum of communicative to noncommunicative repetition.

The general terms used in these studies are not descriptive of specific functions and the range of functional usage. It is imperative that attempts be made to study patterns of delayed echolalia in order to develop an understanding of the communicative patterns of echolalic autistic persons. Schuler (1979) expressed the need to "study the function of the [echoing] behaviors observed within the context of their occurrence" and stated that

"no conclusions about the definition of and differentiation within echolalia or echoic-like behaviors can be drawn without systematic and detailed descriptions of these behaviors" (p. 429).

This study, drawing from the methodology of pragmatic analysis of normal and disordered child language (Dore, 1983; Lund & Duchan, 1983; Prizant & Duchan, 1981), represents a preliminary attempt to determine through systematic analyses how spontaneously produced delayed echolalia was used by autistic individuals. The major purpose of this study, therefore, was to delineate and describe the range of functions served by delayed echolalia produced by individuals with autism.

METHODS

Subject Selection

In order to acquire a sufficient sample of delayed echoic utterances, autistic subjects who had been observed to produce delayed echolalia frequently were sought. Three day-school programs for autistic children were contacted, and one child from each program was referred to us by a classroom teacher or speech-language pathologist as a potential subject. A criterion of at least 20% delayed echolalia of all utterances produced was set for subject selection. Each of the potential subjects was observed informally for approximately 2 hr in classroom activities, at which time it was confirmed that each had met the 20% criterion.

Subjects

The subjects selected for this study were three boys, aged 4:8 (years:months), 12:4, and 14:2, respectively. Each child had been diagnosed as autistic by a psychiatrist, psychologist, or professional evaluation team and displayed the criterial features of the autistic syndrome as described by The National Society for Autistic Children (Ritvo & Freeman, 1977) and Rutter (1978), including (a) disturbances of language and communication, (b) ritualistic and compulsive behaviors, (c) disturbed social relationships, and (d) onset of the disorder prior to 30 months of age. The three subjects attended day-school programs for autistic children, and each lived at home with his parents. All subjects were verbal and produced some emerging spontaneous language forms as well as immediate and delayed echolalia. It was reported that all subjects had acquired some speech which was primarily echolalic (immediate and delayed) prior to 4 years of age. Table 1 presents a breakdown of the subjects' expressive language behavior based on language sample analyses.

Data Collection

Each subject was videotaped twice (30-45 min per tape) in interactions with his classroom teacher or lan-

TABLE 1. Percentage breakdown of expressive language behavior, MLU-M of delayed echolalia and creative language, and expressive language level for each subject.

Child	Age (yrs:mos)	% of delayed echolalia	MLU-M of delayed echolalia	% of creative language	MLU-M of creative language	% of immediate echolalia	% of could not be determined	Spontaneous expressive language level
Subject A	4:8	70 (194/277) ^a	4.51 MLU	7 (21/277)	1.33 MLU	20 (55/277)	3 (7/277)	Brown's Stage 1
Subject B	12:4	38 (82/218)	4.06 MLU	37 (80/218)	1.37 MLU	8 (18/218)	17 (38/218)	Brown's Stage 1
Subject C	14:2	33 (102/304)	3.37 MLU	40 (90/304)	1.24 MLU	26 (80/304)	1 (2/304)	Brown's Stage 1

^aNumber of utterance type/number of total utterances.

guage clinician. All three children had been exposed frequently to videotape equipment, and they gave no evidence of attending to, or being distracted by, the equipment during data collection. Each teacher or clinician was instructed to engage the child in familiar activities within the framework of the child's daily schedule. Activities varied, ranging from directed object and picture description, to less directed object manipulation, to relatively unstructured discussions of favorite activities and free-play interactions. The majority of the teacher/clinician utterances directed to the children were in reference to objects and events in the immediate environment, apparently due to the influence of the cognitive and linguistic level of the children.

Data Analysis

All intelligible utterances from each tape were orthographically transcribed. Unintelligible segments were transcribed using broad phonetic transcription. The researchers reviewed the transcripts, and when necessary, consulted with each child's language clinician or teacher in order to place each child utterance into one of the following categories: (a) immediate echolalia, (b) delayed echolalia, (c) creative utterances, (d) unclassified utterances.

Operational criteria for a delayed echoic utterance were based on descriptions from the limited number of reports currently available. (Kanner, 1946; Prizant, 1978; Schuler, 1979; Simon, 1975). To be considered delayed echoes, utterances had to meet at least one of the following two criteria: (a) They had to be beyond the child's level of grammatical complexity when compared to creative utterances (at Brown's Stage III as determined by the language sample analysis), and/or (b) they had to be identified as memorized routines by the child's language clinician or teacher. Pronominal reversal (i.e., *you/I* or *you/he* substitutions) and evidence of a lack of comprehension of the semantic-syntactic relations within an utterance also provided information which facilitated identification for some delayed echoes; however, at least one of the two criteria listed above had to have been met.

Semantic-syntactic analyses (Lund & Duchan, 1983) and MLU-M calculations (Miller, 1981) were made for all creative utterances. These analyses helped determine the level of expressive language complexity for each of the subjects according to Brown's five stages of language development (Brown, 1973). MLU-M calculations were also made for delayed echoes for each child. (It is recognized that MLU-M is not a true measure of a child's linguistic sophistication when applied to delayed echolalia.) In addition, percentages of each utterance category (cited above) relative to total utterances produced were calculated.

Structural Analysis (Analysis of co-occurring extralinguistic and paralinguistic features which accompanied the production of delayed echolalia). In this level of analysis, each delayed echo was analyzed in reference to its interactiveness, its relevance to the situational and linguistic context, and for any independent evidence of comprehension of the utterance.

• *Interactiveness* was determined on the basis of the following factors:

1. Body posture (directly facing or oriented towards listener)
2. Gaze behavior
 - a. Eye contact
 - b. Gaze check
3. Gestures
 - a. Pointing
 - b. Showing
4. Aspects of the utterance
 - a. Loudness
 - b. Repetition of utterance (if adult didn't respond)

Factors 1 and 2 were necessary for a determination of interactiveness, whereas factors 3 and 4 provided further information regarding functional categorization.

• *Comprehension* of a delayed echolalic utterance was determined on the basis of evidence of at least one of the following behaviors:

1. Gestures or movement relevant to the utterance produced
 - a. reaching
 - b. pointing-showing
 - c. open-hand request
 - d. movement to object
 - e. action on object
2. Verbal response semantically appropriate to prior discourse

3. Behaviors indicating expectation of further action by interactant
 - a. gaze check
 - b. subsequent verbal or nonverbal requests
 - c. physical "prompting" by a subject to induce interactant to respond

A notation was made as to whether behaviors indicating comprehension occurred during or following the production of delayed echolalic utterances, which aided in functional categorization. In some instances, a child may have responded as if he comprehended the full semantic-syntactic relations in an utterance when, in reality, he may have understood only specific elements in an utterance.

• *Relevance to situational or linguistic context* was determined on the basis of the relationship of each utterance to aspects of the situation, to prior discourse, or to a child's nonverbal behavior. An utterance was considered to be relevant to the situational context if it referred to objects, persons, actions, or activities in the immediate environment. Relevance to prior discourse was determined by whether an utterance appropriately extended a topic or provided information relevant to a topic established in prior utterances. Finally, an utterance was considered relevant to a child's nonverbal behavior if it referred to actions a child had just completed, was engaged in, or was about to perform.

Ascribing Functions

After describing delayed echoic utterances in terms of patterns of observable verbal and nonverbal behaviors (i.e., interactive/noninteractive, comprehension/noncomprehension, relevant/nonrelevant to context, and timing of relevant nonverbal behaviors to production of utterances), the next level of analysis involved ascribing functions to structural categories which were defined by unique clusters of features. Although functional categories described in literature on normal child language (Chapman, 1981) and autistic echolalia (Prizant & Duchan, 1981) were referred to for functional categorization, the categories of delayed echolalia were derived from the data and were not determined on an a priori basis.

Fourteen categories of delayed echolalia based on constellations of documented features were derived. Table 2 presents the functional categories and summarizes the features definitive of each category.

Reliability

First, interjudge reliability was determined for identifying delayed echolalia and creative utterances. Twenty delayed echoes and 20 creative utterances were selected randomly from each subject's corpus. Categorization by a second judge yielded a percentage of agreement of 89%.

Second, interjudge reliability for functional categorization was determined by having the second judge, who had been trained in the features of the functional categories,

categorize the 60 randomly selected delayed echoic utterances. Percentage of agreement for functional categorization was 88.3%. Disagreements pertained primarily to the feature of interactiveness of utterances. Intrajudge reliability for functional categorization was determined by having the first investigator recategorize 60 randomly selected delayed echolalic utterances 3 months after original categorization. The percentage agreement between the investigator's original and subsequent categorization was calculated to be 95.0%.

RESULTS

The structural and functional analyses revealed that the general category of delayed echolalia encompasses utterances which may serve a variety of functions and which may be produced interactively or noninteractively, with or without evidence of comprehension, and with varying degrees of relevance to the situational or linguistic context. These findings concur with recent research investigating the functions of immediate echolalia (Prizant & Duchan, 1981).

The functional categories will now be presented briefly, beginning with categories of noninteractive delayed echolalia followed by categories of interactive delayed echolalia.

Functional Categories of Noninteractive Delayed Echolalia

1. *Nonfocused*—Such utterances appeared to be self-stimulatory (Lovaas et al., 1977) and sometimes involved verbal perseveration. Although it is possible that specific intrinsic or extrinsic stimuli may have induced the production of nonfocused delayed echolalia, such stimuli could not be identified in the analysis (see category of Situation Association).

2. *Situation Association*—The major distinction between these utterances and nonfocused utterances was that the production of situation association echoes seemed to be instigated by or associated with a particular identifiable stimulus in the environment. Such a stimulus could include a feature of an object, person, or activity. Thus, some relevance to the linguistic or situational context could be identified. The production of such utterances may have been the product of learned associations between utterances and objects or events.

3. *Rehearsal*—Rehearsal utterances appeared to serve a cognitive function of rehearsal prior to an interactive production of the same utterance. Most frequently, such utterances were produced with low volume or even in a whisper, with subsequent production of the utterance in a louder voice with nonverbal evidence of interactiveness and communicative intent.

4. *Self-directive*—Self-directive utterances served a cognitive function of motoric self-regulation in that they apparently helped the child to direct his own actions in motor tasks. Prizant and Duchan (1981) discovered a

TABLE 2. Fourteen functional categories of delayed echolalia and core attributes of each category.

Categories	Relevance to linguistic or situational context	Evidence of interactiveness	Evidence of comprehension	Other core features	Comments
Nonfocused	No	No	No	Not accompanied by meaningful behaviors	Does not appear to serve any apparent purpose. May be self-stimulatory
Situation association	Yes	No	No	Utterance triggered by object, person, situation, or activity	
Rehearsal	Yes	No	Yes	Practice of linguistic form for subsequent interactive response	Utterance usually spoken in low, soft tone
Self-directive	Yes	No	Yes	Utterance produced prior to or in synchrony with activity, often with low volume	Appears to serve cognitive function of regulating own actions
Label (noninteractive)	Yes	No	Yes	Label in reference to action or object	Similar to label (interactive) but labels to self
Turn-taking	Yes/No	Yes	No	Utterance used as turn filler in alternating verbal exchange	No evidence of communicative intent
Verbal completion	Yes	Yes	No	Completion of verbal routine	Response to verbal routine initiated by other
Label (interactive)	Yes	Yes	Yes	Label in reference to action or object (demonstrative gesture)	No further intentions indicated other than to point out referent
Providing information	Yes	Yes	Yes	Offers new information to listener not apparent from immediate situational context	Utterance may be initiated or in response to other's initiation
Calling	Yes	Yes	Yes	Call attention to oneself or to establish/maintain interaction	Persistence often demonstrated if child does not get listener's attention
Affirmation	Yes	Yes	Yes	Affirmative response to prior utterance	Subsequent behavior indicates affirmative attitude (e.g., takes object)
Request	Yes	Yes	Yes	Requesting in order to obtain object	Focus on object desired. Persistence until goal is achieved
Protest	Yes	Yes	Yes	Protests actions of others	May also be used to prohibit others' actions
Directive	Yes	Yes	Yes	Used to direct others' actions	Goal is to instigate others' actions rather than obtain object (see Request)

similar self-regulatory function served by immediate echolalia. Luria (1966) described a developmental sequence in which overt production of utterances is used to direct behavior initially, with eventual covert or subvocal control of motor behavior. Ricks and Wing (1975) noted that many autistic children appear to be delayed in moving to covert self-regulation of behavior. They also noted a lack of inner language in autistic children, which may result in the need for overt production of utterances to facilitate behavioral self-regulation.

5. *Noninteractive Labeling*—This category was characterized by nonverbal attention to objects (e.g., holding,

demonstrative gesture, etc.). However, there was no apparent effort on the part of the child to direct the utterance to another person. The child appeared to be audibly labeling an object or person, possibly as a form of referential practice. The fact that only one utterance in this category was identified may be attributed to the interpersonal demands of the situations in which data were collected.

Interactive Delayed Echolalia

1. *Turn-taking*—Utterances in this category served as turn-filers in dyadic exchange, probably as an effort to

fulfill a basic requirement of discourse. They were produced as part of an alternating verbal exchange between a child and the adult and often involved multiple repetitions of the same utterance. In some cases, the utterances may have been heard previously in the same context (e.g., in the same room with the same person), but in contrast to situation association echoes, they were produced interactively and in the context of filling a conversational turn. Prizant and Duchan (1981) described a similar turn-taking function for immediate echolalia, as did Shapiro (1977) and Caparulo and Cohen (1977). An interesting aspect of delayed turn-taking echoes documented in this study and immediate turn-taking echoes as described by Prizant and Duchan is that the child clearly waits for a turn in the verbal exchange before offering his or her echolalic contribution. The result of such an exchange is a superficial semblance of the structure of dialogue, even though the child is not adding relevant or new information in the interaction.

2. *Verbal Completion*—In one sense, these utterances seemed to serve as turn-filers; however, their production appeared to be determined by an adult's initiation of a specific verbal routine. For turn-taking echoes, in contrast, the delayed echoic utterances did not involve the completion of a verbal routine.

3. *Label* (interactive)—These delayed echoic utterances were accompanied by demonstrative gestures such as pointing or showing, which served to indicate that they were in reference to the specific objects or actions. Such demonstrative gestures were central to both noninteractive and interactive labeling; however, the latter category was produced with evidence of communicative intent as determined by gaze checks and/or nonverbal evidence of the expectation of some acknowledgment by the adult. There was no such evidence for noninteractive delayed echolalia.

4. *Providing Information*—These utterances served to impart new information to the listener. Such information was not available in the immediate situational context and included expressions of internal state. In some instances, the child appeared to be conveying information by producing an utterance overheard in a previous context in which some need was met.

5. *Calling*—In the few instances in which these utterances were used, the child typically followed up with a request, suggesting that these utterances served as attention-getting devices. One subject was reported to use the routine "Hey you!" to get one's attention in his daily interactions, and this utterance occurred twice during data collection.

6. *Affirmation*—These utterances indicated a willingness and/or a desire to engage in an activity or to accept an item (e.g., toy, food) which had been offered. All three children also indicated affirmation through immediate echolalia, which has been described as "affirmation by repetition" (Kanner, 1943) and "yes-answer" echolalia (Prizant & Duchan, 1981).

7. *Requests*—Delayed echoes serving a request function were goal directed. Typically the goal was acquisition of an object or some food. The child's focus seemed

to be on the object desired, and such utterances were often produced when objects were being withheld or when they were out of reach. Pronominal reversal (using "you" when referring to oneself) was a common feature of request-delayed echoes because adults had referred to the child as "you" in the original situation. Anecdotal accounts (Prizant, 1978; Ricks & Wing, 1975) suggest that a sizable proportion of communicative delayed echolalia, especially in early development, may be requests, probably prompted by the situation and the child's experiences of the clear consequences of such utterances. Two of the subjects also requested objects through single words accompanied by pointing/reaching gestures and alternating gaze. This gestural complex (Bates, 1979) represents a relatively primitive request form which co-occurred with delayed request echoes—clear evidence of two different realizations of the request function.

8. *Protest*—The pragmatic force of these utterances conveyed an apparent desire to prohibit an act or a statement of dissatisfaction about an action taking place or about to take place. Protest echoes were often accompanied by physical attempts to stop the action and were often produced with an extreme emotive tone. The extent to which such utterances are produced may reflect the frequency of reprimands directed to a child.

9. *Directive*—Only one subject used directives, which served to get an adult to initiate some action on an object or to move to a particular location. The primary distinction between directives and requests is that the goal of request echoes was the acquisition of a desired object. For directives, the goal was getting an adult to act and was therefore action rather than object focused.

Table 3 presents the number of delayed echoic utterances in each category for each child and the proportion of utterances in each category relative to total delayed echolalic utterances produced. Individual differences in functional usage are apparent across the three subjects. Turn-taking, request, situation association, label (interactive), and providing information functions were the most prevalent functional categories for Subject A. Subject B produced utterances serving primarily the functions of label (interactive), nonfocused, and situation association, and Subject C's data were comprised largely of utterances serving the functions of providing information, directive, situation association, protest, and turn-taking.

As was expected, the MLU-M for delayed echolalic utterances far exceeded the MLU-M of creative utterances for each subject (see Table 1). The discrepancies in MLU-M between delayed echolalia and creative language for each subject (4.5 vs. 1.33 morphemes, 4.06 vs. 1.37 morphemes, and 3.37 vs. 1.24 morphemes, respectively) highlight the difference between the apparent complexity of delayed echolalia and the relative linguistic simplicity of creative utterances. To reiterate, a measure of MLU-M for delayed echolalia is not a true measure of linguistic complexity because the MLU-M index works on the assumption that the utterances analyzed are the result of the application of productive rules and are not simply memorized segments.

Table 4 provides examples of delayed echolalia and

TABLE 3. Total echo breakdown by functional categories for each of the subjects.

Categories	Subjects			Functional category relative to total echoes	Total echolalia (%)
	A	B	C		
Nonfocused	1	14	2	17	4.5
Situation association	29	10	14	53	14.0
Rehearsal	5	—	—	5	1.3
Self-directive	7	5	6	18	4.7
Label (noninteractive)	—	1	—	1	0.3
Turn-taking	82	—	12	94	24.9
Verbal completion	3	—	—	3	0.8
Label (interactive)	21	44	4	69	18.3
Providing information	12	4	22	38	10.0
Calling	2	—	1	3	0.8
Affirmation	—	—	8	8	2.1
Request	30	4	5	39	10.3
Protest	2	—	13	15	4.0
Directive	—	—	15	15	4.0
Total delayed echolalia	194	82	102	378	
Total utterances for each subject	270	218	302		
% delayed echolalia relative to total utterances	71.9	37.6	33.8		

creative utterances of each child which clearly indicate the differences in linguistic complexity. The creative utterances reflect linguistic patterns indicative of primarily Stage I functioning (Brown, 1973) with some emerging Stage II grammatical morphemes, whereas the delayed echolalia reflects apparent linguistic complexity of much

TABLE 4. Examples of delayed echoic utterances and creative utterances for each subject.

Delayed echolalia	Creative utterances
Subject A	
It's a piece of gum	block away
You get a pringle	want red
Hey, don't put that ring in your mouth	build tower
Go in there and get a block	a blocks
Don't do that, that hurts	want pringle
Subject B	
Put the vitamins away	on brush
Where's Michael at recess?	cap on
That's your new hat	fell down
Help me put the Halloween record away	book (with pointing gesture)
Watch the wheels turn	wanna put away
Subject C	
That's enough	mine
I'm gonna tie you up	eat a cornflakes
On top of your desk, chump!	take home
Get your finger out of your mouth	this (pointing to toy)
You're fourteen years old	eat chicken

greater sophistication, as indicated by the presence of some complex sentence forms.

A comparison of the production of interactive delayed echolalia, noninteractive delayed echolalia serving cognitive functions (rehearsal, self-directive, noninteractive labeling), and other noninteractive delayed echolalia (nonfocused, situation association) reveals the following patterns. All three subjects produced a substantially greater proportion of interactive delayed echoes versus noninteractive delayed echoes serving cognitive functions, versus other noninteractive delayed echolalia (Subject A: 78.5% vs. 6.2% vs. 15.4%; Subject B: 63.4% vs. 7.3% vs. 29.3%; Subject C: 75.1% vs. 6.4% vs. 18.5%, respectively).

A comparison of the production of delayed echolalia produced with evidence of comprehension to delayed echolalia produced without evidence of comprehension reveals the following patterns. Subject A produced a smaller proportion of delayed echolalia with evidence of comprehension than without evidence of comprehension (Subject A: 40.7% vs. 59.3%), whereas Subjects B and Subject C produced a greater proportion of delayed echoes with evidence of comprehension than without evidence of comprehension (Subject B: 70.7% vs. 29.3%; Subject C: 72.5% vs. 27.5%).

DISCUSSION

Status of Delayed Echolalia as Symbolic Communication

The discovery of multiple functions of delayed echolalia in this study has served to specify more precisely the complexity and diversity of such behavior. However, an important related issue needs to be addressed to avoid ignoring the potential danger of misinterpreting these results. This issue pertains to the status of delayed echolalia as symbolic communication.

In the following discussion the broad range of delayed echolalia discovered in this study will be reconsidered in reference to three criteria which have been cited by Bates (1979) as definitive of true symbolic communication: conventionality of the signal, evidence of communicative intent, and an understanding that the signal exists apart from what it refers to; that is, it represents or stands for a referent (e.g., an object, person, action) and is therefore symbolic in nature.

Delayed echolalia can present a rather confusing picture in reference to its conventional status. Superficially, the fact that recognizable word forms are produced would seem to qualify all delayed echolalia as conventional forms. However, many delayed echoic utterances did not meet the criterion of shared function and form within a language community (Bates, 1979).

The use of delayed echolalia in this study can be described on a continuum from little conventionality to greater conventionality. First, some categories of delayed echolalia observed in this study (i.e., nonfocused, turn-taking, situation association, verbal completion) did not

appear to serve any intended communicative function (turn-taking and verbal completion echoes served interactional rather than communicative functions.) In addition, for some delayed echoes, it was difficult to ascertain any relevance to the context in which they were produced, even with knowledge of the child and his communicative patterns (i.e., nonfocused delayed echolalia). It is conceivable that memory of a past event not relating to the present context may have "triggered" delayed echoes or that a child may have perseverated on an utterance because of the way it sounded or "felt." During our preliminary observations, one child repeated "It's a piece of sponge" over 40 times in rapid succession including changes in stress patterns and intonation. We could infer only that the child produced the utterance for auditory and/or tactile-kinesthetic self-stimulation—a kind of intense sound play.

Secondly, some delayed echoes which may be produced for communicative purposes may have highly idiosyncratic meanings, rendering them unconventional and noncommunicative to most listeners. Kanner (1946) used the term *metaphorical language* to denote such utterances with "private meanings." Finally, on the more conventional end of the continuum, delayed echoes that closely approximate culturally agreed upon form/content/function relationships may be recognized immediately as conventional signals (e.g., "Do you wanna eat lunch?" used as a request for food).

To summarize, delayed echoes vary as to the extent of their conventionality, which may vary with different listeners and different contexts. Those familiar with a child may comprehend the meaning and intended function of delayed echoes based upon shared experience, whereas such information may not be available to strangers. In this study, informants familiar with the children helped to circumvent this problem to some extent. Some delayed echoes may never have been intended to serve as conventional signals, whereas the function of others may be quite transparent to relative strangers. Because delayed echoes are, by definition, memorized utterances of a recognizable language system, one may raise the issue of rich interpretation, that is, attributing greater intent and meaning to utterances than is actually the case. This is the central concern of the second major criterion for symbolic communication, evidence of communicative intent.

Fay and Schuler (1980) and Prizant (1983a) have argued that the notion of continuum must also be applied to delayed echolalia when considering the presence or absence of underlying communicative intent. The results of this study indicate clearly that some forms of delayed echolalia were produced with evidence of communicative intent, while others were not. Bates (1979) defined intentional communication as "signaling behavior in which the sender is aware *a priori* of the effect that a signal will have on his listener, and he persists in that behavior until the effect is obtained or failure is clearly indicated" (p. 36). For the categories of request, protest, labeling (interactive), calling, affirmation, directive, and providing information, there was clear evidence of com-

municative intent. Such evidence included alternating gaze between an adult and an object of desire, repetition of utterances if an adult did not comply, and physical "prompts" by the child to make an adult comply. In some cases, aggressive behavior indicated that a child was frustrated in his attempts to achieve a predetermined goal.

Utterances produced without communicative intent fell into three groups: (a) those serving cognitive functions (self-directive, rehearsal, noninteractive labeling), (b) those with no clear function (nonfocused, situation association), (c) and those serving a conversational or turn-filling function (turn-taking, verbal completion).

A brief speculative comment is in order concerning the emergence of communicative intent expressed through delayed echolalia. It is likely that much of a child's early delayed echolalia is perlocutionary, that is, not produced with communicative intent although intent may be assigned by others (Bates, Camaioni, & Volterra, 1975). Such utterances may be produced as situation associations or as conversational turn-filers, in that the child may not have an intended effect in mind. When a child begins to observe and realize that his or her utterances do have specific effects on the behavior of listeners and thus uses utterances more frequently and specifically for a particular effect, it can then be stated with some confidence that the child knows the relationships between his or her signal (e.g., request for food), the effect of the signal on the listener (e.g., listener provides food), and the desired goal (e.g., acquisition of food). It is at this point that the child's behavior can be said to show evidence of communicative intent. With autistic children, however, the production of nonconventional signals (utterances with "private meanings") may preclude a listener's ability to infer communicative intent; thus, reliable judgments of communicative intent may be difficult to make. Only behavioral evidence of communicative intent can be observed; intent itself is unobservable. In this study, we attempted to attenuate this problem by documenting such behavioral evidence and, when necessary, by consulting with individuals familiar with each child's echolalic patterns (see Prizant, 1983b, for further discussion of echolalia and the emergence of communicative intent).

In summary, this study demonstrated that communicative intent may or may not underlie the production of delayed echolalia. When there is behavioral evidence that an utterance is used to achieve a particular result, it may be said with some confidence that the utterance is part of an intentional communicative act.

Although a judgment of conventionality and the presence of communicative intent qualifies some delayed echolalia as conventional communicative acts, the question of the status of delayed echolalia as symbolic activity remains to be addressed. This study does not provide information related directly to this issue; however, it will be addressed due to its relevance to future research.

Bates (1979) defined a symbol as

the comprehension or use, inside or outside of communication situations, of a relationship between a sign and its referent, such that the sign is treated as belonging to and/

or substitutable for its referent in a variety of contexts; and at the same time the user is aware that the sign is separable from its referent, that is, not the same thing. (p. 43)

As with conventionality and communicative intent, delayed echolalia probably represents behavior ranging from nonsymbolic acts to behavior that approaches the status of symbolic activity. Many delayed echoic utterances do not meet the criterion of use in a variety of contexts and therefore cannot be called symbolic in any sense of the word. Such utterances may be used only in very specific contexts, with little generalization to other contexts. Thus, a child who utters "Let's put this away," which is used as a request only to end a specific activity in a specific environment, is probably not engaging in a symbolic act. However, it is a conventional and communicatively functional act if the adult understands and acknowledges the child's intent. If this utterance is used in a wider variety of situations (e.g., different activities, different people), it may be said that the utterance is more symbolic-like.

Many communicative delayed echoic utterances produced by the subjects in this study were reported to be used in a wide variety of contexts and with many referents and would thus meet this criterion for emerging symbolic activity. The emerging spontaneous language forms of the subjects provided independent support that they were capable of symbolic communication. Future research should determine if children's use of delayed echolalia becomes increasingly generalized to a variety of situations and referents at about the same time emerging spontaneous forms appear. The co-occurrence would provide evidence of an emerging capacity to utilize symbols, whether they be single words or memorized multiword units. As Bates (1979) indicated, many behaviors may be "quasi-symbolic," falling in the mid-range of the continuum between presymbolic and true symbolic activity. Much delayed echolalia may be so characterized, for it is likely that once true symbolic activity is achieved (by relatively higher functioning autistic children), much of what we call delayed echolalia will be replaced by and/or evolve into a more flexible language system (Prizant, 1983b). However, the language of even high-functioning autistic individuals rarely approaches the flexibility of "normal" language form and use (Fay & Schuler, 1980).

One other point in Bates's (1979) definition of symbolic activity is relevant to the study of delayed echolalia. She indicated that symbolic activity may occur "inside or outside of communicative situations" (p. 43). This statement helps to clarify the symbolic status of what we have called the cognitive functions of delayed echolalia, i.e., rehearsal, self-directives, and noninteractive labeling. Even though there was no evidence of communicative intent when these utterances were produced, they may be indicative of at least symbolic-like or quasi-symbolic noncommunicative activity when they are produced with evidence of comprehension and when they are used in a variety of contexts and with a variety of referents.

To summarize, delayed echolalia probably represents a diversity of behavioral acts ranging from nonsymbolic

nonpurposeful acts, to quasi-symbolic behavior, to behavior approximating true symbolic activity. Such acts may be used for communication or for cognitive functions. In this study, we were able to observe nonsymbolic delayed echolalia and delayed echolalia apparently used as symbolic acts (both communicatively and cognitively) for each subject. It may be speculated that the cognitive levels of our subjects, coupled with the unique gestalt type of cognitive processing style of autistic individuals (Prizant, 1982, 1983b), makes their status as symbolic processors somewhat tenuous.

CONCLUSION

Clearly, this study has served only as a starting point. The small number of subjects and their roughly equivalent linguistic status limits generalizing the specific findings to all autistic children who produce delayed echolalia. The vast individual differences in usage of delayed echolalia in this study also precludes such generalizations.

However, functional analyses of communicative behavior, regardless of its form, provides a better understanding of how a child's communicative system functions for him or her and leads naturally to specific intervention goals and approaches to accomplish those goals.

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